The Satellite Proving Ground for Marine, Precipitation, and Satellite Analysis

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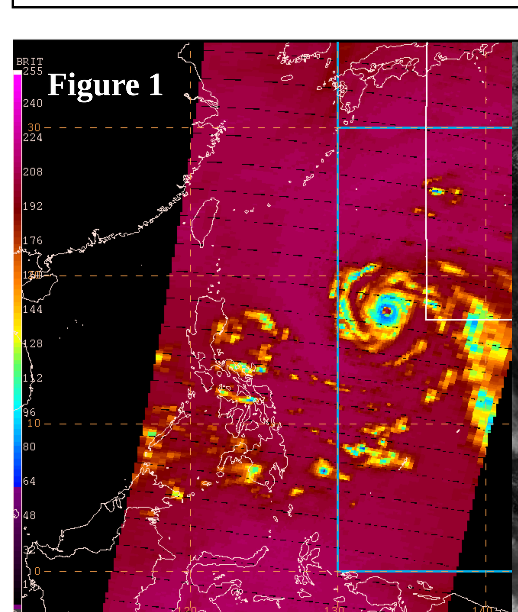
Participating NWS/NCEP National Centers

- Ocean Prediction Center (OPC)
- Weather Prediction Center (WPC)
- Tropical Analysis and Forecast Branch of the National Hurricane Center (NHC/TAFB)
- NESDIS Satellite Analysis Branch

Proving Ground Partners

GOES-R and JPSS Proxy Products (2012-2015)

- Air Mass RGB (SEVIRI, MODIS, GOES-Sounder)
- Overshooting Top Detection & Magnitude
- GOES-R Lightning Detection (using Vaisala and NLDN lightning)
- GOES-14 Super Rapid Scan Operations for GOES-R (SRSOR)
- WRF/NAM Simulated Imagery
- GOES-R Convective Initiation
- Nearcast Model
- AIRS/NUCAPS/IASI Ozone Products
- ATMS 88GHz V
- Day-Night Band
- Fog and Low Stratus
- Additional RGBs: Dust, Day/Night Microphysics, Day Convection, Pseudo-Natural Color, and Saharan Air Layer (SAL) Split-Window



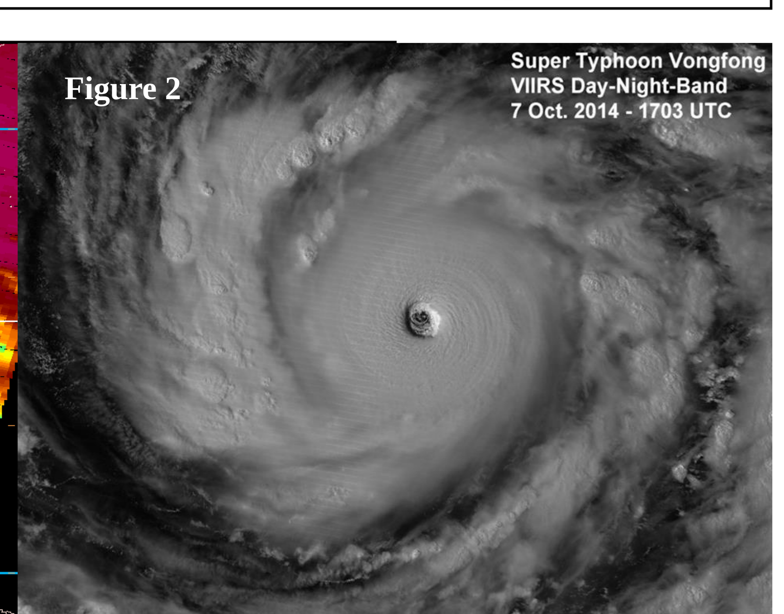


Figure 1: Advanced Technology Microwave Sounder (ATMS) 88 GHz "V" image of Super Typhoon Vongfong at peak intensity of 155 kts (175 mph). Figure 2: The Visible Infrared Imaging Radiometer Suite (VIIRS) Day-Night Band image of Super Typhoon Vongfong.

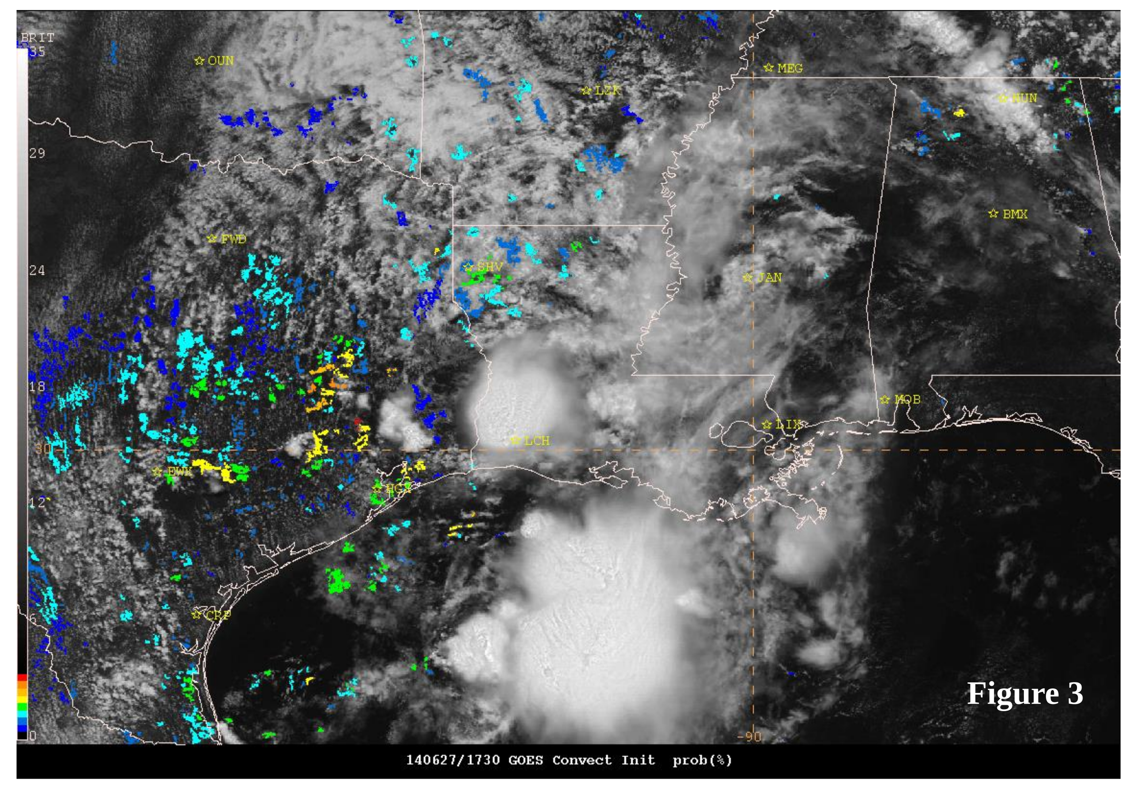


Figure 3: SHORT TERM OUTLOOK VALID 1750-2250Z...HIGH CONFIDENCE FACTOR IN SHORT TERM OUTLOOK... ALREADY CONVECTION HAS DEVELOPED ACROSS PORTIONS OF SE TX/SW LA THIS AFTERNOON WITH SOME LOCATIONS RECEIVING A QUICK 2-3" IN AN HR. INCREASING CONCERN OF ADDITIONAL CONVECTION DEVELOPING/EXPANDING N FROM GULF OF MEXICO AHEAD OF SHORTWAVE TROF THAT IS GRADUALLY LIFTING NEWD ACROSS ERN TX/WRN GULF OF MEXICO. **WITHIN THE LAST HR AN OUTFLOW BOUNDARY HAS BEGUN TO PROPAGATE NWD TOWARDS TO COASTLINES OF SE TX/SW LA WITH NEW CONVECTION ALREADY BEGINNING TO INITIATE. GOES CI ALGORITHM DOES SUGGEST POSSIBLE TO LIKELY ADDITIONAL CONVECTIVE TO DEVELOP AHEAD/ALONG OUTFLOW BOUNDARY IN THE NEXT COUPLE OF HRS.** ATTM OBJECTIVE SFC MOISTURE CONVERGENCE MOISTURE HAS A STRONG MAX LOCATED ALONG THE SW LA COAST. GIVEN THE STRONG SRLY 85H MOISTURE TRANSPORT OF 2.0"+ PWS AND SLOW-MOVING NATURE OF THE SHORTWAVE...THINKING THIS STRONG MOISTURE FLUX SHOULD ONLY GRADUALLY SHIFT NWD OVER THE NEXT 2-4 HRS...FAVORING REPEAT CELL ACTIVITY. ~Warren (SAB)

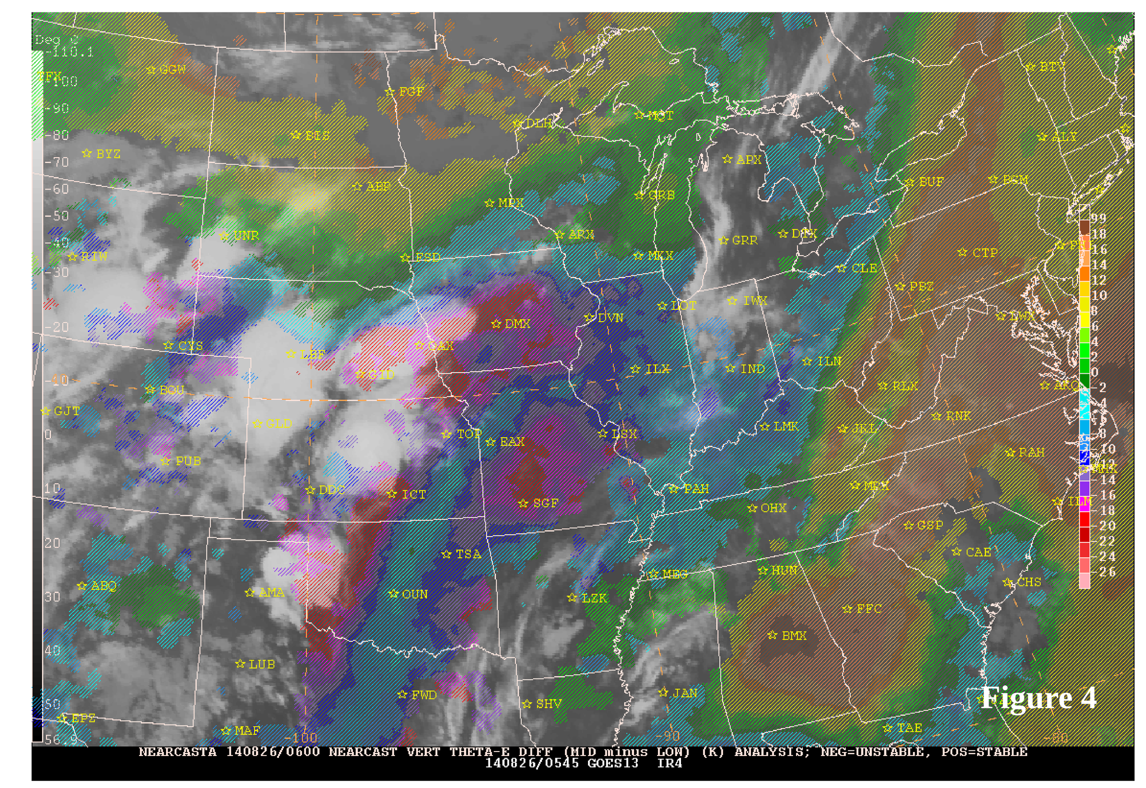
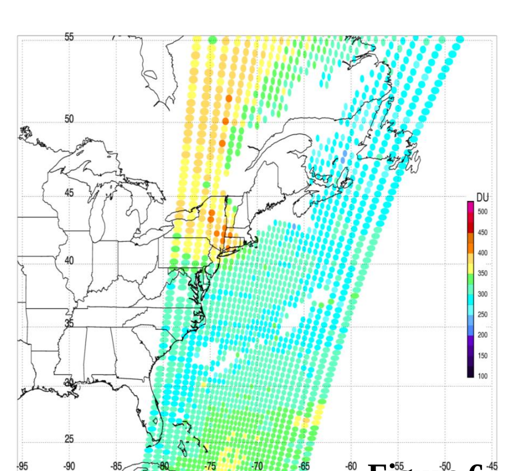
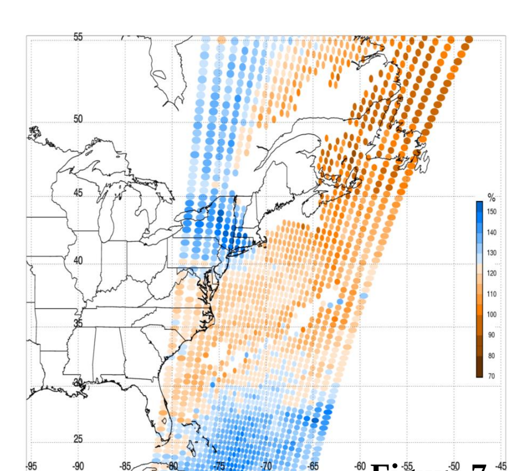


Figure 4: THE 00Z NAM-CONEST AND 00Z NSSL-WRF INDICATE A FORMIDABLE W/E OR WSW/ENE AXIS OF STRONG CONVECTION SETTING UP THROUGH 06Z AND TWD THE PREDAWN HOURS INVOLVING SERN NEB AND CNTRL AND SWRN IA. ADDITIONALLY... **THE EXPERIMENTAL NEARCAST PRODUCT INDICATES AN AXIS OF DIFFERENTIAL THETA-E THAT SUPPORTS AN INSTABILITY AXIS ACROSS SERN NEB AND THROUGH A LARGE PART OF CNTRL AND SRN IA. THIS IS ALREADY WITHIN THE INSTABILITY GRADIENT AS SEEN BY THE LATEST RAP ANALYSIS...BUT THE NEARCAST PRODUCT INDICATES THIS PERSISTING THROUGH 12Z.** THEREFORE...**CONFIDENCE IS RATHER HIGH** THAT CONVECTION WILL CONTINUE TO ORGANIZE AND EXPAND IN A GENERAL WSW/ENE FASHION OVERNIGHT AND ADVANCE INTO OR DEVELOP ACROSS CNTRL/SWRN IA IN PARTICULAR. ~Orrison (WPC)





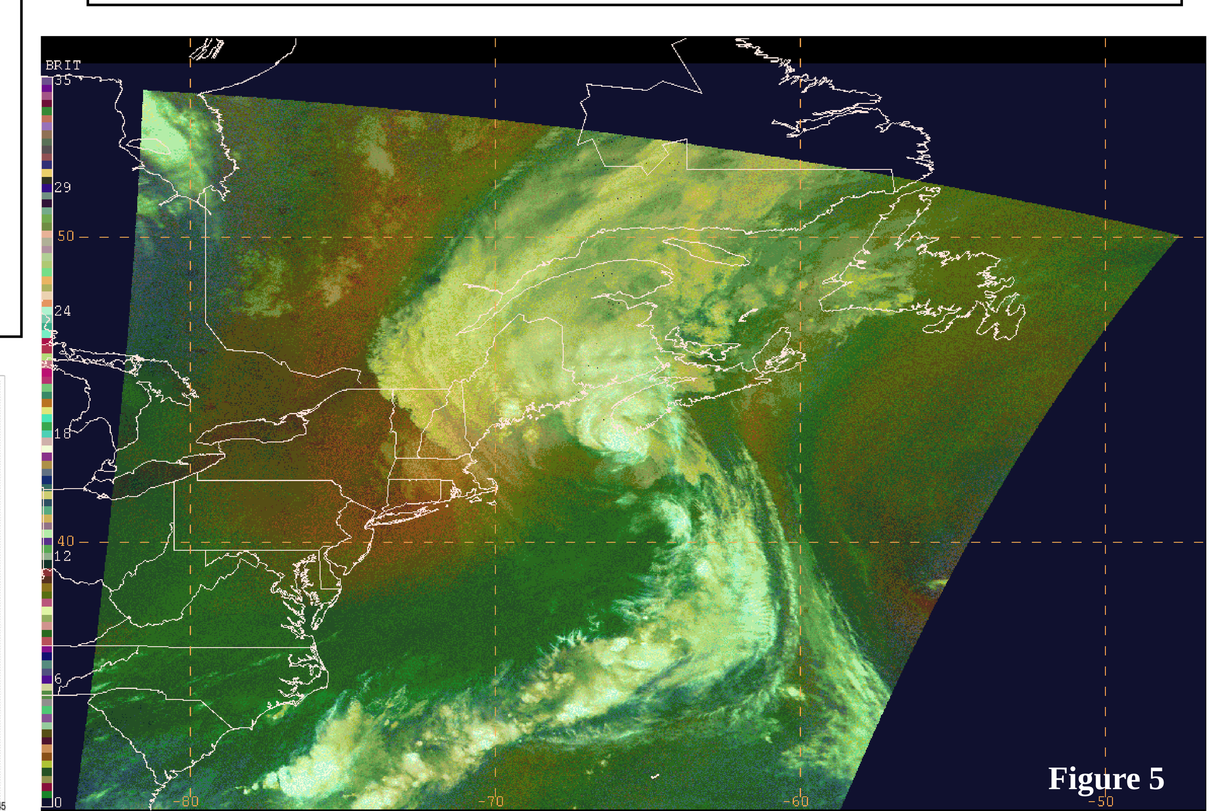
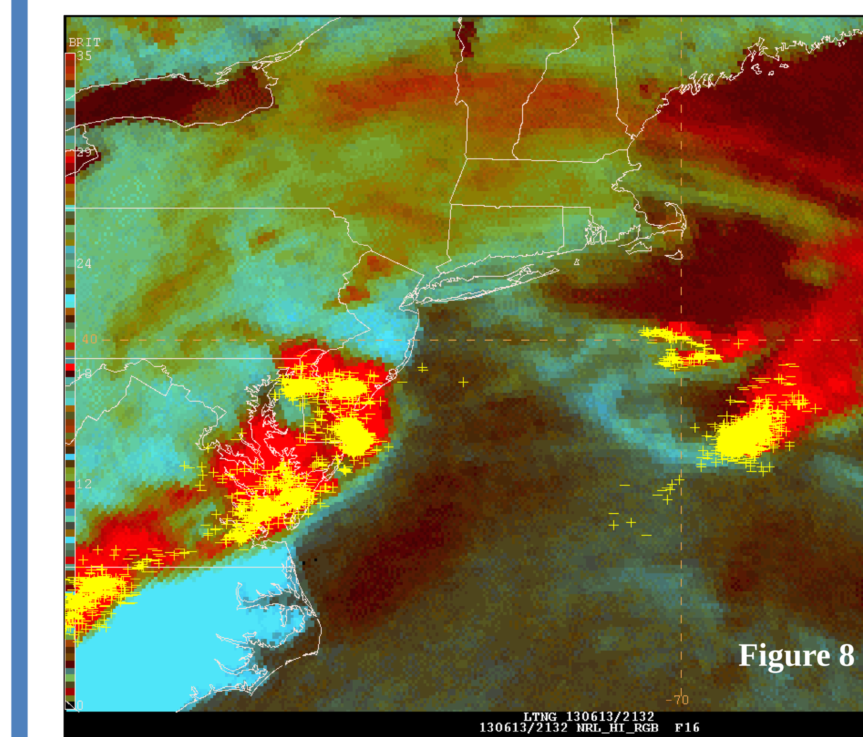
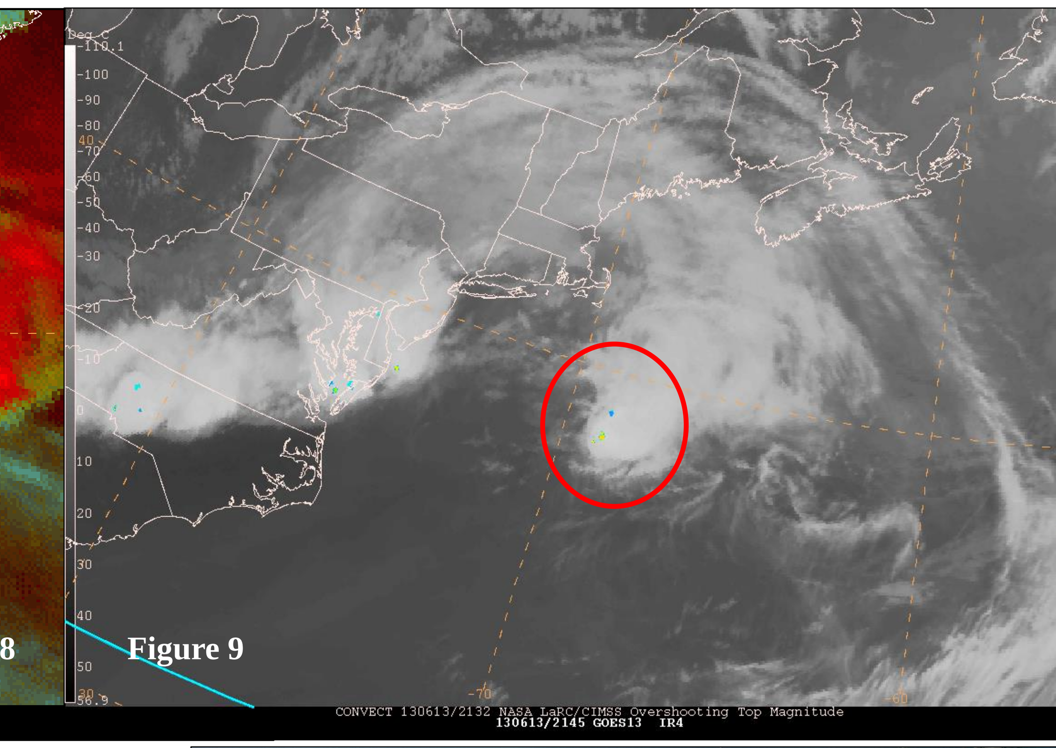


Figure 5: As Hurricane Arthur (2014) began a transition to an extratropical storm on July 5, 2014, evidence of this transition to a more baroclinic system appeared on the MODIS Air Mass RGB product (Figure 5) as dry air (red coloring) moved towards the storm. This dry air coincided with high levels of ozone as noted in the AIRS Total Column Ozone and Ozone Anomaly products (Figures 6 & 7, respectively). Eventually this dry, ozone rich air associated with the trough and upper-low overwhelmed the hurricane and a full transition occurred. Forecasters at the MPSPG have been learning to make this connection when trying to identify these threats.





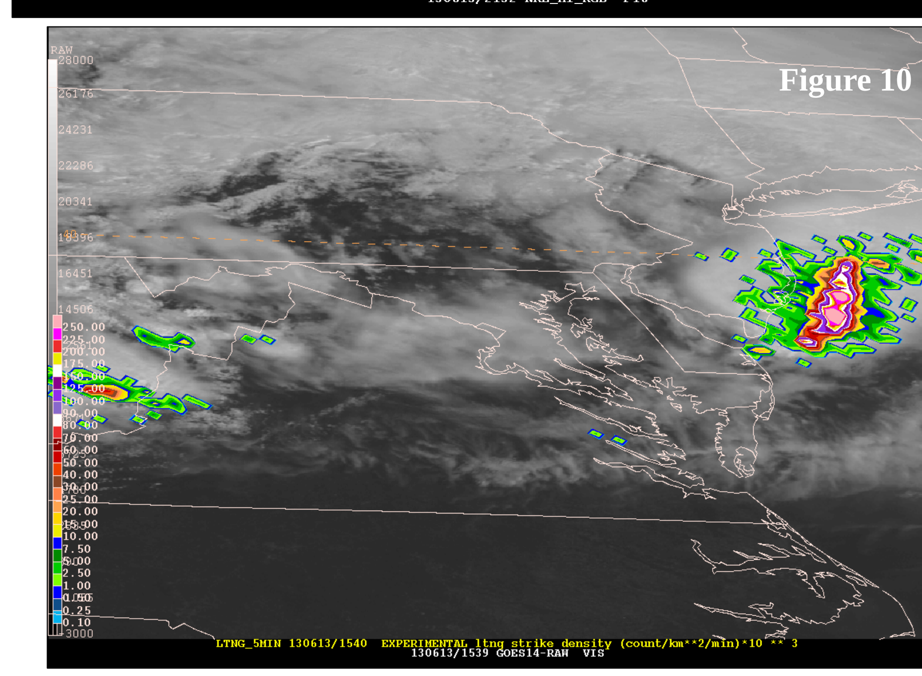
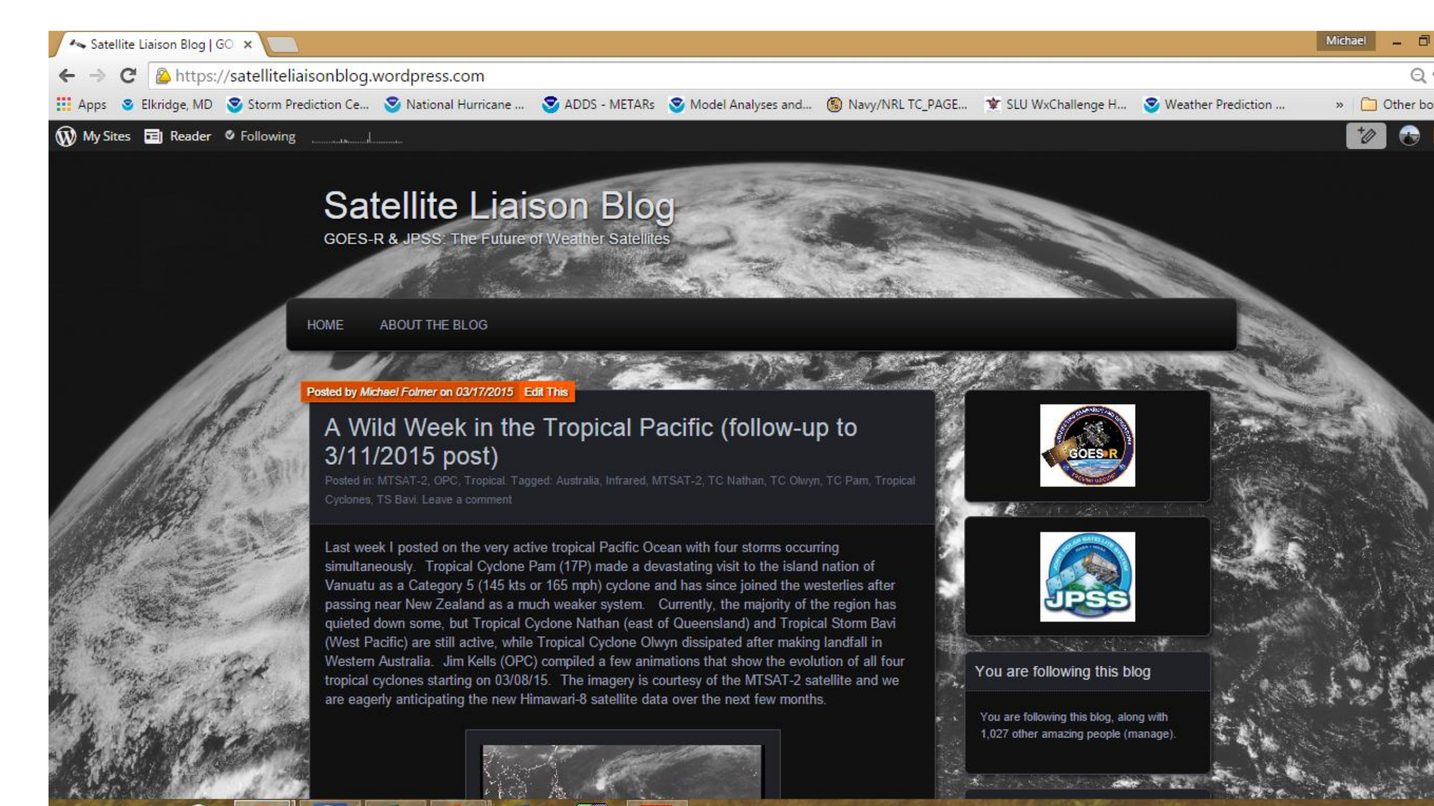


Figure 8: An 89 GHz RGB image from the DMSP F-16 satellite overlaid with the GLD-360 lightning strokes. Figure 9: The Overshooting Top Magnitude product of the same event shows some tops exceeding 9-10 C temperature differences between the overshooting top and the cirrus shield. Figure 10: The GOES-R Lightning Detection (Density) showing lightning activity over a 5-minute window. Figure 11. A sailboat taking part in a race was caught 60 nmi east of Little Egg Harbor, NJ by the line of storms. Shortly after taking the above pictures, the crew encountered winds in excess of 45 knots (52 mph) for approximately 15 minutes. Examples such as these capture the attention of the OPC and TAFB forecasters and have sparked interest in further evaluations and research to identify new techniques to assess convective storms in operations.



The Satellite Liaisons have a blog that covers interesting topics and Proving Ground demonstration pieces. Feel free to follow us at (https://satelliteliaisonblog.wordpress.com/), on Facebook (https://www.facebook.com/goesrpg) or on Twitter (https://twitter.com/satliaisons).